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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/820,046	<b>Applicant(s)</b> LUO ET AL.	
	<b>Examiner</b> Powen Ru	<b>Art Unit</b> 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>20040816</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

This is the initial office action based on the application filed on 4/8/2004. Claims 1-27 are currently pending and have been considered below.

#### *Drawings*

1. The drawings (Fig. 2a and Fig. 3a) are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "70" has been used to designate both polling signal 70 (from the hearing aid module [0038]) and polling signal 70' (to the emitter [0038]). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. In this Office action, the examiner considers the reference character "70" on the right hand side should be the polling signal 70' to the emitter.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the

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description: large gap 134 ([0058]) and large gap 144 ([0060]). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

3. Claim 17 and 27 are objected to because of the following informalities.

Appropriate correction is required.

- Claim 17: "though the optical window" in line 23 should be corrected to "through the optical window".
- Claim 27: "an light reflecting material" in line 19 should be corrected to "a light reflecting material".

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention. By definition, two angles are called complementary angles if the sum of their degree measurements equals 90 degrees. One of the complementary angles is said to be the complement of the other. Claim 3 recites "complementary angle" which cannot always render a proper reflection. For example, if the incident angle is 30 degrees, the reflection angle will be -30 degrees, then the emitter and the detector are directed towards the optical window at 60 degrees with respect to one another. The examiner considers the applicant is trying to express a symmetric angle or the like which renders a proper reflection.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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8. Claims 1 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Marx (4,955,729).

Claim 1: Marx discloses a hearing aid (col 3 lines 5-10) for receiving an input signal (microphone 2, col 3 lines 10-15) and for providing a compensated (amplifier 3, col 3 lines 10-15) output signal (receiver 5, col 3 lines 20-25) for a hearing aid user, wherein the hearing aid is capable of automatically switching between a full-function mode and a sleep mode (e.g., makes/breaks connection, col 1 lines 60-65) depending on the location of the hearing aid (removal/attachment, col 1 lines 63-68), the hearing aid comprising: a hearing aid module (combination of microphone 2, amplifier 3, receiver 5, and other elements described in col 3 lines 5-30) for processing the input signal to generate the compensated output signal; and a location sensor module (light sensitive control, col 6 lines 50-55) connected to the hearing aid module for providing a location information signal (responsive to a change of state during removal or attachment, col 1 lines 65-68) to indicate one of an in-the-ear case (attachment, col 1 line 66) and an out-of-the-ear case (removal, col 1 line 66); wherein the hearing aid module automatically switches (col 1 line 62) to the full-function mode (e.g., makes connection, col 1 line 63) when the location information signal indicates the in-the-ear case and the hearing aid module automatically switches to the sleep mode (e.g., breaks connection, col 1 line 63) when the location information signal indicates the out-of-the-ear case.

Claim 16: Marx discloses a hearing aid as in Claim 1; and further discloses that the location sensor module comprises an optical window (inherently, for the light to pass

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through to reach the light sensitive control element) located on a shell (outer shell 20, e.g., col 6 line 43) of the hearing aid for allowing a visible light signal to pass therethrough; and a reception unit (light sensitive control element, col 6 lines 50-55) for receiving the visible light signal and generating a detection event (removing the hearing aid, col 6 line 59) in the location information signal, wherein the location information signal is adapted to indicate the out-of-the-ear-case (react to incident light, col 6 line 60) if visible light is detected according to reception criteria (col 6 lines 59-68).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2-8, 14-15, and 17-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marx (4,955,729) in view of Deremer et al. (5,818,949).

Claim 2: Marx discloses a hearing aid as in Claim 1; and further discloses a reception unit (light sensitive control element, col 6 lines 50-55; which can receive the reflected light signal and therefore reacts accordingly) and an optical window (inherently, for the light to pass through to reach the light sensitive control element); but does not disclose a transmission unit and a blocking member. However, Deremer et al. discloses a transmission unit (infrared emitter 12, col 3 lines 5-10) for generating a light

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emission signal in response to a polling signal (short pulse, col 3 lines 13-15) and a blocking member (inherently, as otherwise the infrared detector would detect the light signal all the time) placed between the transmission unit and the reception unit for optically blocking the light emission signal from the reception unit; wherein, during the transmission of the light emission signal, the location information signal can be adapted to indicate (produces an electrical signal, col 3 lines 25-30) the in-the-ear-case if the light reflected signal is received according to reception criteria (detects the reflection from the object, col 3 lines 25-30) and the location information signal can be adapted to indicate the out-of-the-ear case otherwise (e.g., not detecting). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to apply a transmission unit for generating a light emission signal and a blocking member optically blocking the light emission signal. As Deremer et al. clearly teaches that the circuit can be incorporated into other sound producing device (col 3 lines 30-35) and significantly improved switching over conventional switching arrangement, one would have been motivated to add Deremer's circuit to Marx's hearing aid.

Claim 3: Marx and Deremer et al. disclose a hearing aid as in Claim 2; and Marx further discloses a light detector (light sensitive control element, col 6 lines 50-55) for detecting the light signal; but Marx does not disclose a light emitter. However, Deremer et al. discloses a light emitter (infrared emitter 12, col 3 lines 5-10) for generating the light emission signal, wherein the light emitter and light detector are directed towards the optical window at a proper angle (not complementary angle, see ***Claim Rejections - 35 USC § 112***) with respect to one another (the emitter is pointed in the direction of an



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object to be sensed and the detector detects the reflection from the object, col 3 lines 13-18) and the blocking member is located between the light emitter and the light detector (inherently, in order to prevent the light emission from reaching the reception unit). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a light emitter for generating the light emission signal and a blocking member arranged to block the light emission signal. As Deremer et al. clearly teaches that the circuit can be incorporated into other sound producing device (col 3 lines 30-35) and significantly improved switching over conventional switching arrangement, one would have been motivated to add Deremer's circuit to Marx's hearing aid.

Claim 4: Marx and Deremer et al. disclose a hearing aid as in Claim 2; and Marx further discloses that the light signal is a visible light signal (e.g., compared to darkness, col 6 lines 58-68).

Claim 5: Marx and Deremer et al. disclose a hearing aid as in Claim 4. By definition, visible signal range (400 - 800 nm) covers between 600 and 800 nanometers.

Claim 6: Marx and Deremer et al. disclose a hearing aid as in Claim 2; but Marx does not disclose that the light signal is an infrared light signal. However, Deremer et al. discloses that the light emission signal and the reflected light signal is an infrared light signal (col 3 lines 8-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to apply infrared technology. As Deremer et al. clearly teaches that the infrared signal can be used to detect the

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reflection off an object such as a human body (col 3 lines 15-20), one would have been motivated to add Deremer's circuit to Marx's hearing aid.

Claim 7: Marx and Deremer et al. disclose a hearing aid as in Claim 6. By definition, the light signal within infrared signal range (800 nm – 1000 nm) has a wavelength greater than 800 nanometers.

Claim 8: Marx and Deremer et al. disclose a hearing aid as in Claim 2; and Marx further disclose the reception unit is biased (adjusted in such manner..., col 6 lines 62-68) at a minimum voltage whereby the reception unit does not generate a response due to ambient light.

Claim 14: Marx and Deremer et al. disclose a hearing aid as in Claim 2; and Marx further discloses a behind-the-ear hearing aid (col 3 line 10) with temperature-sensitive switch; but does not specifically use it as an exemplary embodiment for light-sensitive control. However, with Marx's teaching, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the temperature-sensitive switch of the behind-the-ear hearing aid with a light-sensitive control element and place the optical window on an inside surface (side wall 1a, col 3 lines 60-65) of the behind-the-ear hearing aid.

Claim 15: Marx and Deremer et al. disclose a hearing aid as in Claim 2; and Marx further discloses that the hearing aid is one of an in-the-ear hearing aid, an in-the-canal hearing aid and a completely-in-the-canal hearing aid (ear insert, col 6 lines 50-60), and in each case, the optical window (where the light-sensitive control element attached, col 6 lines 54) is placed on a portion of the hearing aid shaped to match the

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shape of a portion of the concha or the inner auditory meatus (interior of auditory meatus, col 6 line 55) of the hearing aid user in a complementary fashion (completely seal off, col 6 lines 56-57).

Claim 17: Marx discloses a hearing aid as in Claim 16; but does not disclose a transmission unit and a blocking member. However, Deremer et al. discloses a transmission unit (visible light emitting diode 122, col 3 lines 57-60, which can be adapted) for generating a visible light emission signal in response to a polling signal (short pulse, col 3 lines 13-15) provided by a device, the transmission unit being positioned to direct (pointed in the direction of an object to be sensed, col 3 lines 14-16) the visible light emission signal through the optical window; and a blocking member (inherently, as otherwise the infrared detector would detect the light signal all the time) placed between the transmission unit and the reception unit for optically blocking the visible light emission signal from the reception unit; wherein, if the reception unit does not detect visible light, the transmission unit can be polled to generate a visible light emission signal, and the location information signal is adapted to indicate (produces an electrical signal, col 3 lines 25-30) the in-the-ear-case if a visible light reflected signal, derived from the visible light emission signal, is received according to reception criteria and the location information signal is adapted to indicate the out-of-the-ear case otherwise (e.g., not detecting). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to apply a transmission unit for generating a visible light emission signal and a blocking member optically blocking the light emission signal. As Deremer et al. clearly teaches that the circuit can be

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incorporated into other sound producing device (col 3 lines 30-35) and significantly improved switching over conventional switching arrangement, one would have been motivated to add Deremer's circuit to Marx's hearing aid.

Claim 18: Marx discloses a method for switching between modes of operation in a hearing aid (col 3 lines 5-10) capable of automatically switching between a full-function mode and a sleep mode (e.g., makes/breaks connection, col 1 lines 60-65) depending on the location of the hearing aid (removal/attachment, col 1 lines 63-68); but does not specifically disclose a polling signal. However, Deremer et al. discloses a method comprising: providing a polling signal (short pulse, col 3 lines 13-15) for determining the location of a device; generating a location information signal after the polling signal is first provided (produces an electrical signal, col 3 lines 25-30), the location information signal indicating one of an in-the-ear case and an out-of-the-ear case (e.g., detecting or not detecting). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a polling signal for triggering a location information detecting. As Deremer et al. clearly teaches that the method can be incorporated into other sound producing device (col 3 lines 30-35) and significantly improved switching over conventional switching arrangement, one would have been motivated to add Deremer's method to Marx's hearing aid.

Claim 19: Marx and Deremer et al. disclose a method as in Claim 18; and inherently discloses an optical window (for the light to pass through to reach the light sensitive control element) located on a shell (outer shell 20 at a suitable location, col 6 lines 42-45) of the hearing aid; but Marx does not disclose the step of generating a light

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emission signal. However, Deremer et al. further discloses steps of generating a light emission signal (infrared emitter 12 which provides a signal, col 3 lines 5-10) in response to the polling signal (from pulse circuit 11) and transmitting the light emission signal out of an optical window (inherently, for the light to pass through to reach the detector 14, col 3 lines 15-18). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to generate a light emission signal before detecting its reflection. As Deremer et al. clearly teaches that the method can be incorporated into other sound producing device (col 3 lines 30-35) and significantly improved switching over conventional switching arrangement, one would have been motivated to add Deremer's method to Marx's hearing aid.

Claim 20: Marx and Deremer et al. disclose a method as in Claim 19; but Marx does not disclose a reflected light signal. However, Deremer et al. further discloses a step of generating a value in the location information signal (produces an electrical signal, col 3 lines 18-19) according to the reception criteria (col 3 lines 20-21) regarding to a reflected light signal (c3 lines 16-18) received via the optical window to indicate the location information. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to generate a value according to the reflected light signal reception criteria. As Deremer et al. clearly teaches that the method can be incorporated into other sound producing device (col 3 lines 30-35) and significantly improved switching over conventional switching arrangement, one would have been motivated to add Deremer's method to Marx's hearing aid to indicate the in-the-ear case and the out-of-the-ear case.

Claim 21: Marx and Deremer et al. disclose a method in Claim 19; but Marx does not disclose the light emission signal. However, Deremer et al. discloses a visible light emitting diode (122, col 3 lines 57-60) capable of providing a visible light signal for the light emission signal. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a visible light signal. As Marx's light-sensitive control element (col 6 lines 50-55) is capable of detecting the visible light signal (col 3 lines 30-35), one would have been motivated to add Deremer's visible light emitting diode to Marx's hearing aid to provide the light emission signal.

Claim 22: Marx and Deremer et al. disclose a method as in Claim 21. By definition, visible signal range (400 - 800 nm) covers between 600 and 800 nanometers.

Claim 23: Marx and Deremer et al. disclose a method as in Claim 19; but Marx does not disclose an infrared light signal. However, Deremer et al. discloses a step of providing an infrared light signal for the light emission signal (col 3 lines 8-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to apply infrared technology. As Deremer et al. clearly teaches that the infrared signal can be used to detect the reflection off an object such as a human body (col 3 lines 15-20), one would have been motivated to add Deremer's method to Marx's hearing aid.

Claim 24: Marx and Deremer et al. disclose a method as in Claim 23. By definition, the light signal within infrared signal range (800 nm – 1000 nm) has a wavelength greater than 800 nanometers.

Claim 25: Marx and Deremer et al. disclose a method as in Claim 19; and Marx further discloses that the hearing aid is a behind-the-ear hearing aid (col 3 line 10) with temperature-sensitive switch; but does not specifically use it as an exemplary embodiment for light-sensitive control. However, with Marx's teaching, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the temperature-sensitive switch of the behind-the-ear hearing aid with a light-sensitive control element and place the optical window on an inside surface (side wall 1a, col 3 lines 60-65) of the behind-the-ear hearing aid.

Claim 26: Marx and Deremer et al. disclose a method as in Claim 19; and Marx further discloses that the hearing aid is one of an in-the-ear hearing aid, an in-the-canal hearing aid and a completely-in-the-canal hearing aid (ear insert, col 6 lines 50-60); and, in each case, Marx further places the optical window (where the light-sensitive control element attached, col 6 lines 54) on a portion of the hearing aid shaped to match the shape of a portion of the concha or the inner auditory meatus (interior of auditory meatus, col 6 line 55) of the hearing aid user in a complementary fashion (completely seal off, col 6 lines 56-57).

Claim 27: Marx and Deremer et al. disclose a method as in Claim 19; but Marx does not disclose a light reflecting material. However, Deremer et al. discloses a step of placing a light reflecting material (usually a human body, col 3 lines 15-20) over the optical window capable of performing conventional testing on the hearing aid. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to find a light reflecting material. As the applicant admits the

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testing is conventional, one would have been motivated to choose the light reflecting material suggested by Deremer et al. to test Marx's hearing aid.

11. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marx (4,955,729) in view of Deremer et al. (5,818,949), and further in view of O'Donnell et al. (4,905,498).

Claim 9: Marx and Deremer et al. disclose a hearing aid as in Claim 2; and Marx further discloses some resistors (R, col 3 lines 14-17) in the amplifier circuit; and Deremer et al. further discloses the emitter being placed in a direction towards the optical window and driven to emit the light emission (col 3 lines 13-18) in response to the polling signal; but neither specifically discloses a resistor arranged as claimed. However, O'Donnell et al. discloses a resistor (254, col 6 lines 60-68) connected to an output port of a device (timer 236); and an emitter (LED 253) connected to the resistor and ground (see Fig. 3A). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange a resistor in a circuit with an emitter. As O'Donnell et al. clearly teaches that the resistor is capable of current limiting function (col 6 lines 60-68), one would have been motivated to apply O'Donnell's resistor in Marx's hearing aid.

Claim 10: Marx and Deremer et al. disclose a hearing aid as in Claim 2; and Marx further discloses the detector being placed in a direction towards the optical window (inherently in order to receive the light) and some resistors (R, col 3 lines 14-17) in the amplifier circuit; but neither specifically discloses a resistor arranged as claimed.



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However, O'Donnell et al. discloses a resistor (311, col 9 lines 5-15) connected to an input port of a device and to a supply voltage (power supply 221); and a detector (sensor 214 can provide output signal) connected to the input port of a device (comparator 231) and ground (see Fig. 3A). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange a resistor in a circuit with a detector. As O'Donnell et al. clearly teaches that the resistor is capable of current limiting (col 6 lines 60-68), one would have been motivated to apply O'Donnell's resistor in Marx's hearing aid.

12. Claims 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marx (4,955,729) in view of Deremer et al. (5,818,949), and further in view of Smith (5,903,419).

Claim 11: Marx and Deremer et al. disclose a hearing aid as in Claim 2; and Marx further disclose a time delay unit (time delay element , col 7 lines 30-35); but neither specifically discloses an input/output port in the hearing aid module and a transmission gate in the location information module. However, Smith discloses a transmission gate (diode, depicted in FIG. 9) isolating the segmented buses from the i/o port (I/O pad cells, col 13 lines 25-35). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use an i/o port and a diode to isolate the signal from the i/o port. Combining a transmission gate into the reception unit is capable of isolating the reception unit when the hearing aid module polls the transmission unit. After a delay generate by the time delay element, the

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transmission gate can be adapted to connect the reception unit to the hearing aid module. In order to save pin-count, with the existing time delay element, one would have been motivated to apply Smith's i/o port and transmission port in Marx's hearing aid.

13. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marx (4,955,729) in view of Deremer et al. (5,818,949) and Smith (5,903,419), and further in view of O'Donnell et al. (4,905,498).

Claim 12: Marx, Deremer et al. and Smith disclose a hearing aid as in Claim 11; and Marx further discloses some resistors (R, col 3 lines 14-17) in the amplifier circuit; and Deremer et al. further discloses the emitter being placed in a direction towards the optical window and driven to emit the light emission (col 3 lines 13-18) in response to the polling signal; but neither specifically discloses a resistor arranged as claimed. However, O'Donnell et al. discloses a resistor (254, col 6 lines 60-68) connected to an output port of a device (timer 236); and an emitter (LED 253) connected to the resistor and ground (see Fig. 3A). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange a resistor in a circuit with an emitter. As O'Donnell et al. clearly teaches that the resistor is capable of current limiting function (col 6 lines 60-68), one would have been motivated to apply O'Donnell's resistor in Marx's hearing aid.

Claim 13: Marx, Deremer et al. and Smith disclose a hearing aid as in Claim 11; and Marx further discloses the detector being placed in a direction towards the optical

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window (inherently in order to receive the light) and some resistors (R, col 3 lines 14-17) in the amplifier circuit; and the time delay unit can reside in the reception unit as a design choice; but neither specifically discloses a resistor arranged as claimed. However, O'Donnell et al. discloses a resistor (311, col 9 lines 5-15) connected to an input port of a device and to a supply voltage (power supply 221); and a detector (sensor 214 can provide output signal) connected to the input port of a device (comparator 231) and ground (see Fig. 3A). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to arrange a resistor in a circuit with a detector. As O'Donnell et al. clearly teaches that the resistor is capable of current limiting (col 6 lines 60-68), one would have been motivated to apply O'Donnell's resistor in Marx's hearing aid.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Greenspun et al. (5,150,310) discloses a method and apparatus for position detection; Martin (6,148,087) discloses a hearing aid having two hearing apparatuses with optical signal transmission therebetween; and Torii et al. (2001/0024505) discloses an audio system in electronic musical instrument using infrared reflection to locate the position of a device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Powen Ru whose telephone number is 571-270-1050.

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The examiner can normally be reached on Monday-Thursday 7:30am-3:30pm  
EST/EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7654. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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**SINH TRAN**  
**SUPERVISORY PATENT EXAMINER**

PR  
9/28/2006